

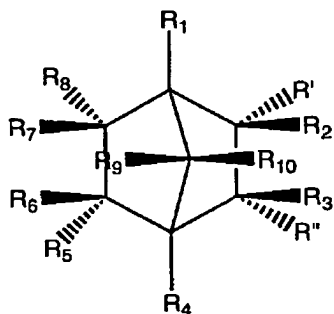
USPTO Customer No. 25280  
Serial No: 10/679,217

Inventor(s): Mannion et al  
Case No: 5646

### IN THE CLAIMS

4. ~~(Currently Amended)~~ ~~An additive~~ ~~thermoplastic formulation~~ ~~additive composition~~ comprising an anti-caking agent and a small size nucleating compound, said composition at least one anticaking agent further comprising component, and at least one nucleating compound conforming to the structure of Formula (I)

(I)



wherein  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$ ,  $R_5$ ,  $R_6$ ,  $R_7$ ,  $R_8$ ,  $R_9$ , and  $R_{10}$  are independently individually selected from the group consisting of hydrogen,  $C_1$ - $C_9$  alkyl, hydroxy,  $C_1$ - $C_9$  alkoxy,  $C_1$ - $C_9$  alkyleneoxy, amine, and  $C_1$ - $C_9$  alkylamine, halogen, phenyl, alkylphenyl, and geminal or vicinal carbocyclic having up to nine carbon atoms;

wherein  $R'$  and  $R''$  are the same or different and are individually selected from the group consisting of hydrogen,  $C_1$ - $C_{30}$  alkyl, hydroxy, amine, polyamine, polyoxyamine,  $C_1$ - $C_{30}$  alkylamine, phenyl, halogen,  $C_1$ - $C_{30}$  alkoxy,  $C_1$ - $C_{30}$  polyoxyalkyl, and esters:  $C(O)-NR_{11}C(O)O-R'''$ , and  $C(O)O-R'''$ ; and

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wherein said nucleator compound is provided in the form of particles, said particles

having a D95 size range of less than or equal to about 94 micrometers at a mean

volume diameter (MVD) of about 16; and

wherein said anti-caking agent comprises one or more of a group consisting of: silica

gel; talc, dihydrotalcite; and metal carboxylate acids; and

wherein said anticaking agent is provided in a weight ratio of anticaking agent to

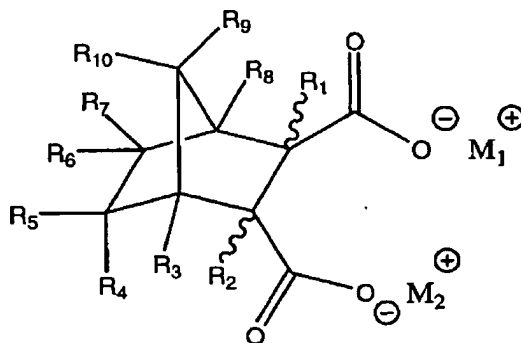
nucleating compound of from about 10:90 to about 30:70.

~~wherein R<sub>1-1</sub> is selected from the group consisting of C<sub>1</sub>-C<sub>30</sub>-alkyl, hydrogen, C<sub>1</sub>-C<sub>30</sub> alkoxy, and C<sub>1</sub>-C<sub>30</sub> polyoxyalkyl, and wherein R<sup>'''</sup> is selected from the group consisting of hydrogen, a metal ion (such as, without limitation, Na<sup>+</sup>, K<sup>+</sup>, Li<sup>+</sup>, Ag<sup>+</sup> and any other monovalent ions), an organic cation (such as ammonium as one non-limiting example), polyoxy-C<sub>2</sub>-C<sub>18</sub>-alkylene, C<sub>1</sub>-C<sub>30</sub>-alkyl, C<sub>1</sub>-C<sub>30</sub>-alkylene, C<sub>1</sub>-C<sub>30</sub>-alkyleneoxy, a steroid moiety (for example, cholesterol), phenyl, polyphenyl, C<sub>1</sub>-C<sub>30</sub>-alkylhalide, and C<sub>1</sub>-C<sub>30</sub> alkylamine; wherein at least one of R' and R'' is either C(O)-NR<sub>1-1</sub>, C(O)O-R<sup>'''</sup> or C(O)O-R<sup>'''</sup>, wherein if both R' and R'' are C(O)O-R<sup>'''</sup> then R<sup>'''</sup> both R' and R'' may be combined into a single bivalent metal ion (such as Ca<sup>2+</sup>, as one non-limiting example) or a single trivalent metal overbase (such as Al-OH, for one non-limiting example).~~

2. (Currently Amended) The An additive formulation, of Claim 1 wherein said additive formulation comprises in part an anti-caking agent and a small size nucleating compound, said small size nucleating compound conforming s to the structure of Formula (II)

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wherein  $M_1$  and  $M_2$  are the same or different and are independently selected from the group consisting of metal or organic cations ~~or the two metal ions are unified into a single metal ion (bivalent, for instance, such as calcium, for example), and~~

$R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$ ,  $R_5$ ,  $R_6$ ,  $R_7$ ,  $R_8$ ,  $R_9$ , and  $R_{10}$  are independently ~~individually~~ selected from the group consisting of hydrogen,  $C_1$ - $C_9$  alkyl, hydroxy,  $C_1$ - $C_9$  alkoxy,  $C_1$ - $C_9$  alkyleneoxy, amine, and  $C_1$ - $C_9$  alkylamine, halogen, phenyl, alkylphenyl, and ~~geminal or vicinal  $C_1$ - $C_9$  carbocyclic having up to 9 carbon atoms. Preferably, the~~

wherein said metal cations are selected from the group consisting of calcium, strontium, barium, magnesium, aluminum, silver, sodium, lithium, rubidium, and potassium, ~~and the like.~~

wherein said nucleator compound is provided in the form of particles, said particles having a D95 size range of less than or equal to about 94 micrometers at a mean volume diameter (MVD) of about 16; and

wherein said anti-caking agent comprises one or more of a group consisting of: silica gel; talc, dihydrotalcite; and metal carboxylate acids; and

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wherein said anticaking agent is provided in a weight ratio of anticaking agent to nucleating compound of from about 10:90 to about 30:70.

3. (Currently Amended) The additive formulation of Claim 2 wherein said metal or organic cation comprises is a metal cation.  
~~selected from the group consisting of Group I and Group II metal ions.~~

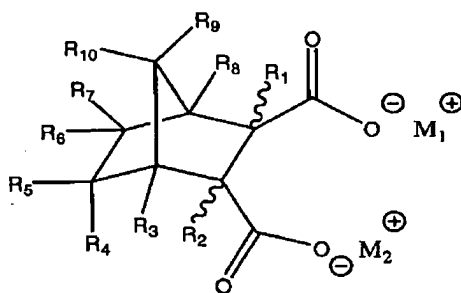
4. (Currently Amended) The additive formulation of Claim 3 wherein said metal cation is calcium. ~~selected from the group consisting of sodium, potassium, calcium, lithium, rubidium, barium, magnesium, and strontium, silver, zinc, aluminum.~~

5. (Currently Amended) The additive formulation of Claim 4 wherein said metal cation comprises is sodium.

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6. (Cancelled) The formulation of Claim 2 wherein said nucleating compound conforms to the structure of Formula (II):



(II)

wherein M<sub>1</sub> and M<sub>2</sub> are the same or different and are independently selected from the group consisting of metal or organic cations or the two metal ions are unified into a single metal ion (bivalent, for instance, such as calcium, for example), and R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, R<sub>9</sub>, and R<sub>10</sub> are individually selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>9</sub> alkyl, hydroxy, C<sub>1</sub>-C<sub>9</sub> alkoxy, C<sub>1</sub>-C<sub>9</sub> alkyleneoxy, amine, and C<sub>1</sub>-C<sub>9</sub> alkylamine, halogen, phenyl, alkylphenyl, and geminal or vicinal carbocyclic having up to 9 carbon atoms.

7. (Cancelled) The formulation of Claim 6 wherein said metal or organic cation is a metal cation

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selected from the group consisting of Group I and Group II metal ions.

8. (Cancelled) The formulation of Claim 7 wherein said metal cation is selected from the group

consisting of sodium, potassium, calcium, lithium, rubidium, barium, magnesium, strontium, silver, zinc, and aluminum.

9. (Cancelled) The formulation of Claim 8 wherein said metal cation is sodium.

10. (Cancelled) The formulation of Claim 1 wherein said anticaking agent is selected from the group consisting of silica gel, talc, dihydrotalcite, metal carboxylic acids, and any mixtures thereof.

11. (Currently Amended) The formulation of Claim 2-10 wherein said anticaking agent comprises ~~is~~ a silica gel.

12. (Currently Amended) A thermoplastic article comprising the formulation of Claim 4-1, said article further comprising and at least one polyolefin.

13. (Currently Amended) A thermoplastic article comprising the formulation of Claim 2, said article further comprising and at least one polyolefin.

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14. (Currently Amended) A thermoplastic article comprising the formulation of Claim 12, said article further comprising ~~10~~ and at least one polyolefin.

15. (Currently Amended) The thermoplastic article of Claim 13, said article further comprising at least one polyolefin, said ~~12~~ wherein said polyolefin ~~being~~ is a polypropylene.

16. (Currently Amended) The additive formulation of claim 1 wherein said small size nucleating compound comprises disodium bicyclo [2.2.1] heptane-2,3-dicarboxylate. thermoplastic article of Claim ~~15~~ 13 wherein said polyolefin is a polypropylene.

17. (Currently Amended) The additive formulation of claim 11 wherein said small size nucleating compound comprises disodium bicyclo [2.2.1] heptane-2,3-dicarboxylate. The thermoplastic article of Claim ~~14~~ wherein said polyolefin is a polypropylene.

18. (Cancelled) A polymer additive formulation as defined in Claim 1, wherein said formulation is present in a form selected from the group consisting of a powder, a pellet, or a liquid, and wherein said composition also comprises at least one thermoplastic polymer.

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19. (Cancelled) A polymer additive formulation as defined in Claim 2, wherein said formulation is present in a form selected from the group consisting of a powder, a pellet, or a liquid, and wherein said composition also comprises at least one thermoplastic polymer.

20. (Cancelled) A polymer additive formulation as defined in Claim 10, wherein said formulation is present in a form selected from the group consisting of a powder, a pellet, or a liquid, and wherein said composition also comprises at least one thermoplastic polymer.

21. (New) The additive formulation of claim 1 wherein said particles comprise a D95 size of less than or equal to about 10 microns at a mean volume diameter (MVD) of about 7.5.

22. (New) The additive formulation of claim 21 wherein said anticaking agent and small size nucleator compound are provided in a ratio of nucleator compound to anticaking agent of about 80:20.

23. (New) The additive formulation of claim 21 wherein said nucleator compound and anticaking agent are provided in a ratio of nucleator compound to anticaking agent of about 80:20.